CONFERENCE ON DISARMAMENT

CD/1150
27 May 1992

Original: ENGLISH

Decision on organizational arrangements in connection with General Assembly resolution 46/36 L

(Adopted at the 622nd plenary meeting on 26 May 1992)

The Conference on Disarmament, having considered the requests of the United Nations General Assembly included in its resolution 46/36 L, "to address, as soon as possible, the question of the interrelated aspects of the excessive and destabilizing accumulation of arms, including military holdings and procurement through national production, and to elaborate universal and non-discriminatory practical means to increase openness and transparency in this field; to address the problems of, and the elaboration of practical means to increase openness and transparency related to the transfer of high technology with military applications and to weapons of mass destruction, in accordance with existing legal instruments; and to include in its annual report to the General Assembly a report on its work on this issue", and bearing in mind the time-frame established in paragraph 11 (b) of said resolution, decides to add to its agenda for its 1992 session an item entitled "Transparency in armaments", under which it can address those issues. The Conference on Disarmament further decides to include in its 1992 report to the United Nations General Assembly a section covering its work on this agenda item.

The Conference also decides to address the agenda item in a series of informal meetings, under the chairmanship of Ambassador Zahran of Egypt.

The Conference has taken due note of the request of the General Assembly to the Secretary-General of the United Nations in paragraph 11 (b) of resolution 46/36 L, to take into account the work of the Conference in his preparation of a report in 1994 on the continuing operation of the United Nations Register and its further development. Further, the Conference has also taken note of the request made to the Secretary-General of the United Nations in paragraph 14 of the same resolution to provide the Conference all relevant information, including, inter alia, views submitted to him by Member States and information provided under the United Nations system for the standardized reporting of military expenditures, as well as on the work of the Disarmament Commission under its agenda item entitled "Objective information on military matters".

GE.92-61573/4114H

UN

CONFERENCE ON DISARMAMENT

CD/1151
1 June 1992

Original: ENGLISH

LETTER DATED 29 MAY 1992 FROM THE REPRESENTATIVE OF NORWAY ADDRESSED TO THE SECRETARY-GENERAL OF THE CONFERENCE ON DISARMAMENT TRANSMITTING A SUMMARY OF A STUDY ON A COMPREHENSIVE TEST-BAN TREATY

My delegation would request your kind assistance in having the enclosed contribution by Norway circulated as a CD document.

The document gives a summary of a study on a Comprehensive Test Ban Treaty which was the subject of a Workshop in Oslo in late March this year.

The full report from the study will be made available later.

(Signed) Jostein Bernhardsen
Minister Counsellor

GE.92-62633

Introduction

For many years the achievement of a Comprehensive Test-Ban Treaty (CTBT) has been a central Norwegian foreign policy goal. A total and permanent ban on all nuclear testing is essential in order to halt effectively both the vertical and horizontal proliferation of nuclear weapons. Furthermore, another important reason for the discontinuance of all nuclear test explosions is the environmental and health risks associated with underground nuclear explosions.

The Conference on Disarmament is an appropriate forum for dealing with the issue of a Comprehensive Test-Ban Treaty. The Norwegian Ministry of Foreign Affairs wished to contribute to the work of the Conference on Disarmament when it took the initiative to carry out a study on some of the most important questions related to a CTBT.

Individual chapters were prepared by renowned international experts and modified in view of comments at a workshop held in Oslo late in March 1992. These chapters discuss reasons for nuclear testing, the history of public opinion on the matter, environmental effects of underground nuclear explosions, partial test limitation treaties in force, attempts at reaching a CTBT, and verifying compliance with a CTBT.

A final chapter presents the assessment of the experts assembled at the workshop on the utility and feasibility of a CTBT, based on the material of the individual chapters and the discussion and analysis at the workshop. This document consists of the final chapter of the study.

The members of the expert group were:

- Professor Steven A. Fetter
  University of Maryland
- Professor Trevor Findlay
  The Australian National University
- Professor Joseph Rotblat
  Pugwash Conferences on Science and World Affairs
- Professor Richard L. Garwin
  Columbia University/IBM Research Division
- Dr. Jozef Goldblat
  Arms Control Consultant
  Senior Lecturer and Research Fellow at the Geneva Graduate Institute of International Studies
- Phil.lic. Jan Prawitz
  Ministry of Defence, Sweden
- Director Frode Ringdal
  Norwegian Seismic Array (NORSAR)

The report was finalized at a workshop in Oslo 30-31 March 1992. Director Sverre Lodgaard of the International Peace Research Institute, Oslo, chaired the workshop.

PERSPECTIVES FOR A FUTURE COMPREHENSIVE TEST-BAN TREATY (CTBT)

I. Purpose and objectives of a CTBT

Ever since the destruction of Hiroshima and Nagasaki in 1945, nuclear test explosions have served as a constant reminder of the threat to the survival of mankind. For years they were also seen as a manifestation of the nuclear arms race and of the competition between the super-Powers for world hegemony.

Nuclear testing is now on the decline. In 1991, the total number of test explosions was the lowest in 30 years. At the same time, major reductions in the nuclear armories are being planned.

The main argument for a CTBT is no longer the need to halt the arms race among the nuclear-weapon States. Today, the two overriding concerns are:

- the environmental effects of continued nuclear testing;

- the dangers of nuclear proliferation.

These aspects, as well as the military and political implications of a CTBT are discussed in detail in the various chapters of this report. A brief summary of the motivation for a CTBT is given below:

Environmental aspects

One of the central purposes of the 1963 Partial Test-Ban Treaty was to reduce the radiation hazard from nuclear tests. This has been borne out by the experience since then, but nevertheless there are numerous examples of venting of radioactive debris following underground nuclear tests.

Venting has occurred at all the major nuclear test sites, and has in some cases been detected across national borders. In the United States, a particularly serious incident was the venting from the Baneberry test on 18 December 1970, which was also registered in Canada. At the Semipalatinsk test site in Kazakhstan, many people appear to have been exposed over the years to significant doses of radiation after venting. A recent example of venting at the Novaya Zemlya test site in the Arctic part of Russia is the nuclear explosion on 2 August 1987, which caused radioactivity to be detected in Scandinavia.

An almost permanent legacy of underground tests is the inventory of long-lived radioactive elements deposited underground. In terms of health effects, this addition to the radioactive burden is small. However in some cases, as in the Moruroa Atoll, leakage may occur also in the short term. Little is known about the long term effects of such contamination, and this is clearly a case for concern.

Special concern has been expressed in the Nordic countries about the potentially adverse effects of continuing nuclear testing in the fragile Arctic environment of Novaya Zemlya.

A CTBT would put an end to the additional contamination of the environment with radioactive substances released by future nuclear explosions.

Non-proliferation aspects

A CTBT would help legitimize increased international pressure on the nuclear threshold countries who have not joined the NPT to forgo the nuclear weapon option. In some cases, regional approaches to a CTBT might be important steps toward this aim.

A CTBT would strengthen the non-proliferation regime by eliminating one element of friction concerning the inequality of the obligations assumed under the Non-Proliferation Treaty by the nuclear haves and nuclear have-nots.

A CTBT would satisfy an important requirement put forward by some non-nuclear-weapon countries for the extension of the duration of the Non-Proliferation Treaty after 1995 - for another lengthy period (or periods) or indefinitely.

In principle, it would be possible for a non-nuclear-weapon State to build a nuclear armoury without testing. This is surely far more feasible than it was in 1945 or during the 1950s. However, in an era in which both a CTBT and the NPT were in force, such an activity would be fraught with political hazards. There is also a high likelihood that a non-tested stockpile would in fact not function.

An important psychological impact, not usually taken into account, would occur through the weapon scientists and engineers of the advanced nuclear States. If nuclear testing is made illegal, the nuclear weapon personnel in the United States and Russia will be extremely vigorous about policing such a ban in the rest of the world, as well as in their own countries.

For these two reasons - the psychological motivation of large numbers of people in the nuclear-weapon establishment in the nuclear-weapon States to police vigorously a CTBT, and the hazards, impediments and uncertainties which a CTBT era would impose on the would-be proliferators - a CTBT would be a major tool to inhibit proliferation of nuclear weaponry.

Military and political implications

A CTBT would be an event with considerable confidence-building effects. It might strengthen the growing conviction about the uselessness of nuclear weaponry for the security of nations.

It might relieve the psychological stress associated with the apocalyptic nature of nuclear weapons.

In so far as concern about "technological surprise" has driven the arms race, a CTBT may remove one of the causes of this apprehension: it would make it unlikely that something completely new, unpredictable and exotic would suddenly emerge in the nuclear field.

Under a CTBT regime, the nuclear-weapon States would be expected to maintain high reliability of nuclear weapons to ensure deterrence. However, if confidence in the stockpiled weapons were to be gradually eroded, the probability that a nuclear-weapon Power would launch a first disarming nuclear strike would be further diminished.

A CTBT would provide a tangible proof that the nuclear-weapon Powers have decided to proceed from quantitative cuts of their arsenals to qualitative constraints.

By contributing to confidence building, a CTBT may facilitate the negotiation of other multilateral arms control measures. It is noteworthy that no multilateral nuclear arms control agreement of a global nature has been concluded since 1980.

A CTBT would signal a considerable reduction in the human and material resources which are spent on the development and modernization of nuclear weapons. The savings would be substantial; the cost of a single nuclear weapon test explosion is estimated at 30-100 million US dollars.

The conclusion of a CTBT would fulfil the pledge undertaken by the parties to the 1963 Partial Test-Ban Treaty to negotiate a total ban on nuclear weapon test explosions. It would also go some way towards meeting the obligation undertaken by the nuclear-weapon Powers under the 1968 Non-Proliferation Treaty, and included in United Nations resolutions, to bring about nuclear disarmament.

In the early days of the nuclear era, a CTBT would have had a major impact on limiting the numbers of nuclear weapons and their overall capability. Today, the major reductions that are underway in the United States and former Soviet armouries are more significant than a CTBT would be at this moment. Nevertheless, a CTBT would add to the benefits of these reductions.

II. Arguments for further testing - an assessment

Many reasons have been advanced in favour of nuclear testing. Among the main arguments are: to support the development of new nuclear weapons, to ensure confidence in the nuclear stockpile and to improve the safety and security of nuclear weapons. Some of these arguments have merit. However, they must be weighed carefully against the arguments in favour of a CTBT.

Looking back over more than three decades of occasionally intense public debate over nuclear test limitations and the advisability of a CTBT, it is striking how the arguments against a CTBT are now weakened.

During the 1980s the traditional objection in the United States to a CTBT (lack of verifiability) was supplemented by a long list of objections. Each is considered in turn below.

Safety considerations

If nuclear weapons must exist, they should be as safe and secure as possible. Nuclear weapons should be immune from accidents such as a nuclear explosion or a dispersal of plutonium if a bomb is dropped accidentally, and they should be protected from unauthorized use by both terrorists and armed forces personnel.

Questions of safety and security of nuclear weapons can be explored by analysis and non-nuclear tests. Enhanced control over nuclear weapons can be obtained by refitting modern permissive action links (PAL), but in an era in which there is a massive decrease in numbers of nuclear weapons, older weapons can be destroyed first, leaving the surviving warheads as the safest and most secure.

Not only do reduced numbers of warheads contribute to enhanced overall safety and control, but the lack of a requirement for a hairtrigger response allows them to be stored and maintained more securely.

Development of new warheads

The principal argument for nuclear testing, now as always, is to support the development of new nuclear weapons. Whatever the urgency in the past of weapon tests to develop new warheads in order to respond to developments on the other side, it is far less now.

Indeed, the argument was never compelling. When the United States sent John Glenn, the astronaut, into space, it did not redevelop him. Instead, NASA packaged him, so that he would be protected against the vacuum, cold, heat, and shock of the flight.

New delivery vehicles can be built around the existing designs of warheads. It is not necessary to develop new warheads to achieve this aim.

Finally, there are experiments in physics that can best be done with nuclear explosions and sometimes in no other way. But the physics community, in fact, has not in general proposed to spend money on such experiments, even when there was no bar to doing so.

Stockpile confidence

Much of the nuclear nations' drive for nuclear testing in the past arose from the desire to gain an advantage over the other side, or to learn what the other side might already have learned in nuclear testing or might be able to learn, so as not to be "behind" the other side.

It was argued that many deficiencies had been discovered in stockpile nuclear weapons through nuclear testing, and that they required nuclear testing to remedy. In reality, no weapon that had been thoroughly tested in development revealed unexpected troubles in stockpile testing, within the range over which it had been tested. Nuclear tests did reveal deficiencies at

extremely low ambient temperature, or with older tritium boost gas than had been used in the test. But suspected deficiencies of this type could have been countered by non-nuclear measures.

Although nuclear redesign or the substitution of a new development was sometimes the preferred "remedy", this was certainly not necessary. For the future, there is technical agreement between those in the weapon laboratories and those outside that a vigilant programme of stockpile inspection and non-nuclear testing will suffice to reveal potential problems. These problems can then be remedied by re-manufacturing the warheads to the original specifications. Fifty years from now that may not be the most convenient approach, since industrial processes will surely change, but it will just as surely be a feasible one.

The proposal is not to keep individual nuclear warheads reliable for 100 years, which would lead to a whole new field of weapon geriatrics, but to remanufacture them after 10-15 years, so that one would always be dealing with weapons precisely of an age and type with which the weapon establishments have experience.

Maintaining expertise

It is inevitable that the technological base for weapon development and stockpile maintenance will erode under a CTBT, but this process is likely to be gradual. Moreover, it is likely that the nuclear-weapon States would continue to give considerable support of their weapon laboratories, in order to ensure that essential expertise is not lost.

To prevent a kind of genetic drift by the accumulation of small changes, each one "certified" to be insignificant by a responsible board, is a matter of putting in place a board composed of responsible technical people interested in maintaining the stockpile at initial performance, rather than in incorporating "bright" ideas.

Expertise can also be maintained in the study of inertial confinement fusion (ICF), and there is, in fact, a problem of definition if one approaches useful power release from multiple explosions of tiny pellets in the ICF programme.

In the context of a CTBT, a possible approach would be to announce in advance the location and time of every explosion of any kind with an explosive yield above 10 tons, and to carry out nuclear-related explosions, such as ICF, only in permanently occupied buildings.

III. Verification of compliance with a CTBT

A CTBT would need to be accompanied by a global verification system. The principal component of such a system would be an international monitoring network of sensitive seismic stations. Such a system should make use of the most recent technological advances and also incorporate high-quality stations of the array type. On-site challenge inspection, use of satellite imagery,

measurement of airborne radionuclides and other supplementary verification measures are also envisaged. Provisions for reporting and possibly observing chemical explosions exceeding a specified size should be worked out.

The text of a CTBT should be publicized widely by all treaty parties. All parties should also enact national legislation prohibiting their citizens from engaging in activities that are banned internationally under a CTBT, including a requirement that violations must be reported to national and international authorities. In fact, verification by the people, or "whistle-blowing", might add an entirely new dimension to the effectiveness of CTBT verification. This is particularly relevant in view of the recent developments in the formerly closed Soviet society.

Given a CTBT era in which the State's commitment and its domestic legal standing is widely publicized, and in which United Nations sanctions may follow discovery of a clandestine test, it seems unlikely that a signatory State would attempt clandestine testing.

IV. Possible approaches to a CTBT

A Comprehensive Test-Ban Treaty (CTBT) would be a multilateral treaty banning all nuclear test explosions by all States for all time:

> We recommend the early signing and ratification by the nuclear-weapon States of a CTBT to take effect, say, in 1995.

If the United States and Russia decide instead to negotiate further limitations on nuclear tests, as they have pledged to do, the first step should be meaningful: it should severely constrain, if not render impossible, the development of new designs of nuclear weapons by the nuclear-weapon States and the manufacture of nuclear weapons by non-nuclear-weapon States.

A limited test ban, whatever the threshold or annual quota, may apply only to nuclear-weapon States. Any tests still permitted under such an agreement would have to be subject to stringent measures to prevent environmental damage. Any new limited test ban would have to contain a binding commitment to a total ban.

A nuclear test ban concluded among the States in particularly sensitive regions, like South Asia or the Middle East, could constitute an early step toward renunciation by these States of the nuclear weapon option.

CONFERENCE ON DISARMAMENT

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CD/CW/WP.410
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ENGLISH
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SPAIN

REPORT ON A TRIAL CHALLENGE INSPECTION

1. INTRODUCTION

In May 1991, Spain carried out a trial inspection in a civilian chemical plant in an attempt to comply with the rules that the Convention on the prohibition of chemical weapons will in time lay down for systematic inspections of declared facilities producing or capable of producing substances listed in Schedules 2 and 3.

The Government of Spain recently decided to take the steps necessary to carry out a trial inspection at a military facility according to the rules for challenge inspection at an undeclared facility. That is the subject of the present report.

Among the main objectives of that operation there naturally stands out that of testing the currently foreseeable provisions of the final text of the Convention. However, the inspection was also aimed at:

Defining with greater precision the competence of the National Authority regarding the organization and conduct of this type of inspection;

Identifying the real difficulties that the effecting of a trial inspection may cause at the national level;

Testing the challenging State's observer status under the Convention;

Acquiring experience in searching for and processing evidence of the existence of chemical warfare agents in a military facility;

Analysing the suitable composition of inspection teams;

Studying criteria applicable to the protection of the confidentiality of information provided to inspectors and to the security in general terms of the challenged country.

The participants in the inspection included, for purely learning purposes, a far larger group of military and civilian experts than that described in this report. Those purposes being considered internal to the Spanish armed forces, the report contains no detailed information on the activities of the persons in question, their assignment falling outside the scope of the Convention.

The provisions taken into account for the conduct of the inspection were those contained in the rolling text in document CD/1116.

2. PREPARATION FOR THE INSPECTION

2.1 Facility inspected

At the first preparatory meeting for the inspection, it was decided that the site selected should be one where conditions were as difficult and realistic as possible. Consequently, of the alternatives available, the choice finally settled on a naval base where, within an area of 400 hectares, there are 138 structures comprising above-ground and underground munitions dumps, laboratories, workshops, fuelling stations and health and logistical support facilities, as well as administrative buildings and living quarters. The site lies in a deep valley surrounded by high hills and open to the sea, with rolling terrain largely covered by trees. The entire perimeter is closed off by a fence and there are two road entrances and an exclusively military harbour.

2.2 Challenge

The ground on which the implementation of the inspection machinery was based was taken to be a challenge for possible storage and handling in the facility of munitions filled with chemical warfare agents, i.e. for breach of articles I and VI of the Convention.

The challenge specified the location of the suspect facility by means of broad geographical coordinates and references that did not relate strictly to the facility, but to the zone in which it lies.

2.3 Composition of the teams

2.3.1 Inspection team

A team leader with experience of CFE inspections;

A weapons engineer (chemist) from the La Marañosa National Factory with extensive knowledge of the Convention;

Two experts in CFE inspections;

An expert in nuclear, bacteriological and chemical (NBC) warfare and instructor at the Army NBC College.

2.3.2 Composition of the escort team

This team, which represented the National Authority, comprised:

A team leader with experience of CFE inspections;

An expert in NBC warfare and instructor at the Army NBC College;

A naval weapons engineer designated by the inspected facility;

Two experts in CFE inspections and arms control negotiations;

A chemist from the La Marañosa National Factory with expert knowledge of laboratory techniques;

A naval munitions specialist designated by the facility.

2.4 Observer from the challenged State

The person designated for this function was a nuclear engineer representing the General Directorate of Armaments and Equipment.

2.5 National observers

Although their presence is not provided for in the text of the Convention, the following persons participated, for learning purposes, as observers:

Two diplomats familiar with the text of the Convention;

Two representatives of the Ministry of Defence;

One representative of each verification cell from each of the three General Staffs.

3. CONDUCT OF THE INSPECTION

3.1 Prior stages

The sequence of events that triggered the inspection was taken to be the following:

The Director General of the Technical Secretariat notifies the Spanish Government of the existence of a challenge against Spain for possession and storage of chemical weapons in an undeclared facility identified by geographical coordinates;

The National Authority takes measures to facilitate the inspection team's entry to Spanish territory via the point of entry and sets in motion the machinery for the provision to the inspectors of escort and transport

services and assistance. The inspection team's arrival at the point of entry was assumed to have occurred within 24 hours of the notification to the Spanish Government;

At an initial coordination meeting between the inspection team and the Spanish authorities, the team spells out in greater detail the content of the challenge, its requirements for the inspection and the perimeter to which access is sought;

Simultaneously with this first meeting, the entrances to the perimeter requested by the inspection team are closed, except for one, chosen on a map provided by the National Authority, which is placed under surveillance by means of continuous video recordings;

Following the definition of the facility to which the challenge relates and the securing of the tentative perimeter, all participants in the inspection are flown to the airport closest to the zone containing the facility.

3.2 Negotiation concerning the perimeter and controlled access

The leader of the inspection team, the facility chief and the representative of the National Authority negotiated to reach agreement on the perimeter of the challenged facility.

In view of the geographical features of the terrain and of the need to apply the procedures and techniques of "controlled access" by the inspectors to the various buildings in the facility, thereby protecting effectively the security of the challenged State, the negotiation concerning the perimeter was assumed to be straightforward and the requested perimeter was made to match the agreed perimeter from the outset.

Immediately thereafter, and thus within the time-limit laid down in the text of the Convention, the inspection team was taken to the final perimeter.

To make the trial inspection as effective as possible while safeguarding the security of the facility, the next step was to define, within the agreed final perimeter, a system of controlled access defined as follows:

All the land entrances except one were kept closed, and a check was kept on entry and exit by goods vehicles via the only open such entrance and on berthings and sailings via the marine access;

Random access to the munitions tunnels, powder stores and workshops through the selection in each case of 20 per cent of the total, it being considered that the quantity chosen represented a sufficiently meaningful sample.

3.3 Inspection plan

On receiving the inspectors, the facility authorities conducted a briefing session and provided the inspectors with the following documentation:

1. A sketch map of the facility referring to all the significant elements within it;

2. A diagram of the wastewater system.

The authorities described the activities carried on within the facility and were simultaneously informed of the inspection team's logistical and administrative needs.

There followed a brief overflight of the perimeter immediately outside it in a helicopter without any type of sensor.

During the overflight, special attention was paid to the usable access points in the fence marking the perimeter of the facility.

The inspection plan was drawn up to allow for a maximum reasonable time for the inspection of 48 hours.

The members of the team, in keeping with the assumptions for the trial, were divided into the following groups:

A. Management of the inspection and visual inspection.

B. Taking, custody and, where appropriate, analysis of samples "in situ".

C. Surveillance of the perimeter and of the inside of the facility.

The management groups assignment was to go through the specified facilities, to look for evidence and to decide what samples should be taken and where they should be taken.

The sampling group's assignment was to go only to the points identified by the management group in order to take the samples requested by that group and to seal and guard those samples.

The assignment of the perimeter surveillance group was to monitor the exit of goods vehicles by the land access point and the marine access point and to check that the other land entrances and the perimeter fence remained closed.

The buildings and facilities that it was agreed to inspect were the following:

Above-ground powder magazines: one from each module in each group;

Munitions storage tunnels: two from each group;

Laboratories: reagents, documentation, instruments, analytical equipment;

Workshops: infrastructure, ventilation system, etc.;

Wastewater disposal and treatment system: sampling;

Waste treatment plant: sampling of the air and of suspect containers;

Fuelling station: non-fuel chemicals;

Fire service: equipment for the neutralization of chemical agents;

Medical service: drugs, casualty records for chemical agents, etc;

Library: books and documents on the use and storage of chemical agents.

The itinerary drawn up for the inspection group precluded the transfer of munitions from uninspected to inspected buildings.

3.4 Search for evidence

3.4.1 Munitions

The methods employed to investigate the presence of possible chemical agents in munitions were non-destructive.

The first step was to select and weigh various projectiles.

Then ultrasound was used to determine for each of them the thickness of their steel casing at various points.

On the one hand, these measures gave an idea of the inside shape of the projectile and on the other they provided information necessary for the subsequent gamma-radiographic examination.

This examination was made with the projectile placed at an inclination of 30° such that, had the charge been liquid, the horizontal surface line would have been detectable.

Once the gammagram was available, it was studied for the presence of cylinders, partitions, etc.

In any event, the gammagram made it possible to estimate the volume, and thus the weight of the metal section.

Deducting the weight of the metal section from the total weight of the projectile gave the weight of the charge; the volume of the charge being known, the final step was to deduce its density.

Had the density been between 1 and 1.5, there would have been grounds for suspecting the charge to comprise chemical agents and other, more conclusive types of test would have been made.

The non-destructive methods of analysis were supplemented by the taking of samples.

3.4.2 Facilities

As regards the search for evidence in other buildings and facilities, the procedure was as follows:

A search was made for the presence or otherwise of collective chemical protection systems such as water or air filters, the electrical capacity and installation were investigated, etc.;

In the munitions, gunpowder and explosives storage tunnels, the ventilation systems were also examined in a search for collective filters, and in conclusion air and powder samples were taken;

In the chemical laboratories, inspections were made of the equipment and reagents present and of the buildings' infrastructure;

In the workshops, checks were made of whether the tools and facilities could be used for the assembly, handling or filling of chemical munitions and whether the facility's structure and departments were capable of supporting such activities;

In the case of the fire service, a search was made for chemical protection and decontamination equipment;

In the infirmary, a search was made for evidence of the presence of antidotes to chemical warfare agents such as Oximas or any other pharmacological compound usable to treat lesions caused by chemical agents.

3.5 Collection of samples

Samples were taken in the places indicated and on the elements marked by the management group and all of them were held permanently in the custody of the sampling group.

All the samples were taken in duplicate, with one of them, after having been duly authenticated by the inspectors, being left in the control of the facility authorities.

3.5.1 Gaseous samples

For the samples of ambient air, use was made of a Gibson-type constant-flow pump with an intake of 1 litre/minute through tubes filled with activated charcoal into an 8 x 70 mm column.

The selective samples of gases in projectiles explosives canisters were taken with small-diameter (6 mm) glass tubes filled with 0.1 gr of TENAX- and XAD-2-type resins. The plug replacing the fuse in the projectile was unscrewed without removing it completely and the tube with the resin was inserted into the canister and 250 cc of air were slowly absorbed.

3.5.2 Liquid samples

Samples of waste water were taken in two different forms:

Volume of 200 cc in glass flasks with an airtight Teflon plug;

Volume of 1 litre through glass tubes filled with TENAX resin.

3.5.3 Solid samples

Depending on their origin, these were collected using two different procedures:

Samples of earth, solids, rubber, fabrics, etc., were taken by placing in glass tubes with airtight Teflon plugs small quantities of the substance together with a small amount of anhydrous potassium sulphate to reduce hydrolysis during transport;

Samples of stains on concrete which could not be extracted by scraping with a spatula were obtained by using cotton wool soaked in dichloromethane that was then placed in an airtight tube with anhydrous potassium sulphate.

3.6 Transport of samples

The gaseous samples were suitably packaged and transported in an icebox with Jelly-Ice.

The liquid samples were transported in glass flasks with the products separated into TENAX- and XAD-4-type columns.

The solid samples, like the others, were sealed and labelled with a code corresponding to the record made out for each sample.

3.7 Analysis of samples

The analyses were carried out in the NBC laboratory of the La Marañosa National Factory after the inspection and lasted two days.

3.7.1 Preparation of samples

The gaseous samples absorbed by the tubes of activated charcoal were extracted by the counterflow technique using 20 cc of dichloromethane and were then concentrated to 0.5 cc in a microconcentrator.

The liquid samples transported in glass bottles were passed by gravity through small glass tubes filled with 50 mg of XAD-4. After drying by centrifuging and the passage of dry nitrogen, they were extracted with 0.5 cc of ethyl acetate.

The solid samples were placed in a SOLHET extractor with 25 cc of dichloromethane. After being subjected to various extraction cycles, the solution was treated with anhydrous potassium sulphate and concentrated in a microconcentrator to a volume of 0.5 cc.

3.7.2 Qualitative analysis

The following methods were employed:

Gas chromatography with flame-photometric detector (GC-FPD);

Gas chromatography with selective mass detector (GC-MS);

Gas chromatography with infrared detector (GC-(FT)IR).

The first method is of high sensitivity for indicating the presence of agents containing sulphur or phosphorus.

The second is a more powerful means of identifying, with adequate precision, the compounds extracted.

In the event of the detection of a sufficiently high concentration of warfare agents in the sample, the most suitable method of confirming the result obtained by MS is considered to be GC-FIR analysis.

3.8 Taking of photographs

By prior agreement between the inspection team and the local authority, the photographs requested by the team were taken by personnel belonging to the facility. The camera was of the instantaneous development type and the photographs were taken in two copies, of which one was handed over to the inspection team and the other to the facility personnel.

Only photographs directly relating to disagreements arising during the inspection with regard to matters such as the capacity of ventilation systems, suitability of infrastructure, safety signs, etc., were taken.

4. ANALYSIS AND COMMENTS

4.1 Security of information

Meticulous preparation of the facility personnel and the escort team is necessary in order to avoid the disclosure of sensitive information and, at the same time, provide the information necessary for the inspection team to be able to do its work.

4.2 Composition of the inspection team

The number of inspectors will depend on factors that will vary with each facility, bearing in mind that the inspection must furnish the best possible guarantee of the non-presence of chemical weapons and that the inspection team should be kept as small as possible.

Account must be taken of the following:

In most cases, the inspection team will have to split into at least two subteams having similar or different functions and each comprising at least two inspectors;

Each subteam will have to have at least one assistant to help with record-making, the transport of equipment and the search for evidence.

4.3 Composition of the escort team

The escort team will have to have a technical capability equivalent to that of the inspection team so that it can serve as a competent interlocutor between the inspection team and the inspected facility.

There should be at least one of its members in each of the groups into which the inspection team divides.

Lastly, the escort team will have to manage all the support services and infrastructure needed by the inspection team.

4.4 Closing off of the perimeter of the facility

For understandable reasons of shortage of staff, and on the other hand, because of the need not to paralyse the activities of the facility, the closing-off and surveillance of the perimeter of the inspected facility turned out to be one of the inspection team's hardest tasks.

In the trial, control of the perimeter was achieved by closing and sealing all the access points in the perimeter except one, over which the inspection team exercised surveillance by making random checks of the goods vehicles entering or leaving the enclosed area.

In the trial in question, the ideal minimum number of staff assigned to the closing and controlling of the perimeter of the facility was set at four people, which, despite being a minimum figure, significantly increases (by almost 75 per cent) the ideal number of members of the inspection team, which may be estimated at about five.

While four men would have been sufficient in this case, it must be borne in mind that the military facility inspected on this occasion is perfectly delimited by the surrounding hills and by a well-nigh impenetrable fencing system and that there are very few vehicular entry or exit points.

4.5 Initial tour of the facility

In most cases, the initial tour of the facility will be of substantial assistance in drawing up the inspection plan, even though it may in some instances take a considerable amount of time.

Sometimes the value of a tour made by terrestrial transport may be small if it is not supplemented by observation from a point dominating the entire

facility or by a short overflight by helicopter; the latter is considered very useful both from the point of view of time-saving and because it enables the inspection team to set an overall idea of the facility without revealing details that the inspected State may wish to keep secret.

4.6 Taking of samples

Sample-taking is an arduous task that requires a great deal of time and therefore determines the rhythm of the inspection. Consequently, the inspection team should, if possible, be organized in such a way that the inspectors who are specifically concerned with sample-taking can begin their work as soon as possible and, if that can be managed, immediately following the initial tour of the facility after the team leaders have negotiated and agreed a mutually acceptable inspection plan with the authorities of the inspected facility.

Consequently, the inspection team's tasks should be flexibly organized so as to save time, even though that necessitates using more vehicles, means of communication and personnel, which will have to be supplied by the facility.

Each sample must be duplicated. This result can be achieved by simultaneous sampling by the inspection and escort teams using the same apparatus and procedures or by division of a single sample.

For each sample obtained, a record must be made out showing: the date, time and place of the taking of the sample; the procedure used to obtain the sample; the team employed; the type of sample; the inspector or technician who took the sample.

In many cases, sampling need not be destructive, since it is generally possible to determine whether a charge is chemical or not by means of sensitive non-destructive techniques.

The sampling groups must comprise one or two technicians from the inspection team, another from the escort team and at least one assistant to help with packing, registering, etc.

4.7 Analysis of samples

Only in very specific cases will the evidence found enable definitive conclusions to be reached without the need to analyse the samples taken.

Moreover, carrying out the analyses at the inspected facility will, as a general rule, be impossible for one of the following reasons:

The inspected State or the facility's process of work will not permit it;

There will not be enough time for the analysis during the period set for the inspection;

The facility will not have the right staff or instruments to carry out the analysis.

Lastly, it should be borne in mind, that although "in situ" analysis is very convenient, qualitative analyses undertaken under such conditions cannot be very reliable. It is preferable to take the samples to a laboratory and to analyse them there.

4.8 Photographs

The taking of photographs is one of the most delicate aspects of the security of the facility during the inspection and it must be ensured that it does not represent a breach of that security. For this reason, it is advisable that:

Photographs should be taken only of the documents or equipment that are needed as evidence in order to resolve a difference in interpretation;

In order to avoid unauthorized shots, photographs should be taken by the escort team at the request of the inspection team. Accordingly, the inspection team should not carry either still or video cameras;

The photographs that are taken should be made in two copies for the inspection and escort teams and should permit immediate verification, for which reason they should be of the instantaneous development type;

All the photographs taken should be attached to the inspection report and should be signed by the leaders of the inspection and escort teams, with an indication of the date, time and place of their taking and a brief description of what they show;

For the use of flash units in the taking of photographs, account should be taken of the safety regulations at the facility.

4.9 Reliability of challenge inspections

Recourse by a State party to the future Convention on the prohibition of chemical weapons to the challenging of another State party before the Organization on the basis of reasonable evidence entails a definite political risk deriving from, inter alia, the fundamental limitations of such inspection at a party's request.

Challenge inspection has, indeed, a conceptual limitation that derives from its nature, by virtue whereof there can only be certainty as to its result if the latter is positive, that is, if evidence is found of the current or past presence of chemical weapons.

It is obvious that proof of non-presence, however exhaustive the operation may be, always leaves room for doubt; hence, also, the fundamental differences proven by the experts of the Spanish armed forces between this

system of inspection in the Convention on Chemical Weapons and the similar systems in the CFE Conventions, in which the object is to verify the existence of various equipment.

In view of all this, it was possible to prove in practice through the trial what was already a virtual certainty before the trial was carried out: challenge inspection must be a last resort, being markedly political in nature, and the more closely the interests of the inspected State and the inspection team coincide - a coincidence based on the desire on the one hand to dispel the doubts affecting the security of the challenging State, and the existence on the other hand of an overwhelming desire to prove the "innocence" of the inspected State and thereby its proper fulfilment of the provisions of the Convention - the more reliable will be its result.

Subject to these conditions, the institution of challenge inspection will be totally effective and will fill the role expected of it within the framework of the overall system of verification and the Convention on Chemical Weapons.

4.10 Observer

As was foreseeable, the figure of the observer proved controversial and it was therefore agreed to restrict his access to and participation in the inspection to the strict limits compatible with his existence.

While the observer fulfils the important purpose of providing the challenging State with guarantees as to the efficiency with which the inspection team performs its duty, his constant presence in inspection activities is impossible because it transforms security problems into matters more important than the inspection itself and provokes on the part of the challenged State attitudes of excessive rejection and distrust that can vastly complicate an exercise of this nature.

Notwithstanding, the observer was informed, solely by the leader of the inspection team and/or the leader of the escort team, about all the aspects of the inspection, beginning from the time when the plan was drawn up until the preparation of the final report, and including all the intermediate stages.

The observer was prevented from having access to any type of documentation and to any of the facilities inspected and remained, with an escort, in a facility building until the operation was completed, with periodic reports being made to him on its progress.

4.11 Time-limits

In conclusion, emphasis must be placed on the importance according to Spain's experience as described in this report of time-limits during the initial stages of the conduct of a challenge inspection. This point may indeed be of such importance as to compromise the very reliability of the

results obtained. The time that elapses between the notification to the challenged State and the completion of the negotiations concerning the perimeter and the actual entry of the inspection team into the area where it is to begin its work must be kept to the minimum compatible with the resolution of the difficulties there are to be overcome: the negotiations concerning the perimeter, while probably the greatest problem and the greatest point of concern for legitimate security reasons, can be reduced in importance if it is borne in mind that controlled access techniques are an effective means of catering to those security concerns and can thus lessen the drama of negotiating the final perimeter.

CONFERENCE ON DISARMAMENT

CD/1153
CD/CW/WP.412
11 June 1992

ENGLISH ONLY

LETTER DATED 11 JUNE 1992 FROM THE CHARGE D'AFFAIRES A.I. OF NORWAY ADDRESSED TO THE PRESIDENT OF THE CONFERENCE ON DISARMAMENT, TRANSMITTING A RESEARCH REPORT ENTITLED "VERIFICATION OF A CHEMICAL WEAPONS CONVENTION: RECOMMENDED OPERATING PROCEDURES FOR SAMPLING AND SAMPLE HANDLING, PART XI"

I have the honour to transmit to you a research report entitled "Verification of a Chemical Weapons Convention: Recommended Operating Procedures for Sampling and Sample Handling, Part XI". This research report represents a further contribution of Norway to the negotiations in the Conference on Disarmament on a Chemical Weapons Convention.

I would appreciate it if the report could be circulated as an official document of the Conference on Disarmament as well as the Ad Hoc Committee on Chemical Weapons.

(Signed) Bjørn Skogmo
Ambassador
Chargé d'affaires a.i.

RESEARCH REPORT ON VERIFICATION OF A CHEMICAL WEAPONS CONVENTION

RECOMMENDED OPERATING PROCEDURES FOR SAMPLING AND SAMPLE HANDLING

PART XI

ROYAL NORWEGIAN MINISTRY OF FOREIGN AFFAIRS
OSLO, JUNE 1992

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SUMMARY

The collection and handling of samples is an important part in verification of a chemical weapons convention. Reliable results from sophisticated analytical equipment can only be obtained if the samples have been collected and treated properly. This report gives complete procedures for sampling and sample handling in connection with both verification of alleged use and verification of alleged production in a chemical facility.

The recommended operating procedures presented here are based on extensive field testing at the Norwegian Defence Research Establishment during the last ten years in order to reveal problems which do not arise in laboratory experiments.

The procedures deal with all parts of sampling and sample handling, including localization of the contaminated area, the amounts and sizes of samples which should be collected, and the preferred sample materials. Methods for packing, securing and transport of samples are also described together with sample handling in the laboratory.

One of the most important parts of the sampling procedure is proper documentation of the samples, sampling site and sampling procedures. A form has therefore been drawn up in which all information obtained during sampling should be written. A transport log which should follow the samples from the sampling site to their destination has also been worked out and is presented in this report.

The last part of sample handling is treatment of the sample in the laboratory. Procedures for sample homogenization, splitting and preparation before the final analysis have been developed.

It is important to have proper equipment available for sample collection and sample handling. . A list of suitable equipment has therefore been included in this report.

1 INTRODUCTION

In order to implement a chemical weapons convention successfully, it must be possible to verify violation of any part of the convention. Procedures should be available in connection with verification of alleged use of chemical weapons, existing stocks, their destruction, and the non-production of chemical weapons by the chemical industry. Verification of alleged use requires somewhat different procedures from verification of a production facility. This paper presents one complete procedure for each of these separate activities, even if parts of the procedures are similar.

A complete verification procedure may be divided into several parts, including methods for localization of the contaminated area, sampling, sample handling including preservation, packaging, coding and documentation, transport, sample handling in the laboratory and laboratory analysis. In the context, the laboratory could either be a designated laboratory or the laboratory of the Technical Secretariat. All these stages must be carried out properly in order to ensure that verification is as reliable as possible.

The recommended operating procedures for sampling and sample handling, which are crucial steps in any verification procedure, are based on several years of extensive study. The reliability of verification is influenced by various factors such as where the samples are collected, the kinds of sample materials chosen and how the samples are treated before reaching the laboratory. During transport, it is important to ensure that the transport log is properly completed in order to maintain un unbroken chain of custody.

All the procedures recommended have been thoroughly tested in field trails, which are used to test all methods and techniques and make them functional for field use. Efforts have been made to develop procedures using readily available, unsophisticated equipment.

2 ALLEGED USE

2.1 Verification of location

Upon arrival in an area where use of chemical warfare agents is alleged to have taken place, the position (coordinates) should be checked against the information given by the requesting state party to ensure that the correct area is examined. This should be done by comparing the terrain with a map, or by using navigational aids such as the global positioning system (GPS).

2.2 Localization of the contaminated area

When the reported position has been verified according to the methods in Chapter 2.1, the area possibly contaminated with chemical warfare agents should be localized. This localization should be based on information collected in the following ways:

- Possible eye witnesses should be interviewed to obtain information about the attack, the existence of bomb craters, remnants from shells etc or about animals or people affected by the attack.

- Signs of battle activity, remnants of bombs, shells, etc., and the position of injured animals or people should be inspected and taken as an indication of the position of the contaminated area.

- A limited area may be examined using hand held detection devices such as the chemical agent monitor (CAM) and detection paper or reconnaissance vehicles (e.g. Fuchs). Such devices should also be used to define the pattern of contamination in the area. To make it easier to define the upwind edge of the contaminated area, the examination should

be started upwind of the area and be continued in the wind direction to the other side.

2.3 Sampling

2.3.1 Recommended sampling sites

When the contaminated area has been localized and examined in accordance with the methods described in Chapter 2.2, the sampling sites should be selected using the following criteria:

- Samples should be collected within the area where the highest concentrations of chemical agents are believed to be found, i.e. in the area where the highest concentrations have been indicated by the localization procedures (Chapter 2.2).

- Weather conditions influence the persistence of chemical warfare agents. Samples should therefore be collected from sites where weather conditions have least influence on the recovery of the various agents.

- If it is impossible to define the contaminated area, samples should be collected randomly over the whole area where the use of chemical warfare agents was alleged to have taken place.

2.3.2 Recommended sample materials

When samples are collected for verification of the use of chemical warfare agents, it is important to consider the sample materials which should be selected:

- Sample materials which adsorb the chemical warfare agents efficiently should be selected.

- It must be possible to desorb the agents from the sample materials for analysis.

- The sample material should not have properties which accelerate the breakdown rate of the chemical warfare agents.

Several different types of sample materials may be found in a battlefield environment, and the recommended types are listed below:

- *Liquids from bombs or shells*. If bombs or shells containing liquids are found, they should be sampled because the liquid is likely to be a chemical warfare agent.

- *Other liquids*. Liquids or damp spots found in the contaminated area should be checked with detection paper for the presence of chemical warfare agents. If the test result is positive, samples should be collected for further analysis.

- *Filter canisters*. Filter canisters used by personnel exposed to, or believed to be exposed to, the chemical warfare agents should be collected.

- *Textile materials, leather*. Samples of textile materials or leather used by personnel exposed to the chemical attack should be collected because these materials have been shown to adsorb chemical warfare agents efficiently.

- *Polymers*. Polymers such as rubber, plastic, paint etc. also adsorb chemical warfare agents efficiently and should be collected if they are found in the contaminated area.

- *Environmental samples*. Environmental samples such as snow, sand, soil, vegetation, surface water, concrete, etc. should be collected from several sites in the contaminated area. Since experiments have shown low vertical diffusion rates for chemical warfare agents in solid samples, only the top layer (about 2 cm) should be collected.

Biological samples may be of interest, but may be more difficult to collect for religious or ethical reasons. Such sampling also requires special techniques and should be carried out by medical personnel.

- *Body liquids*. Blood, urine or other body liquids should be collected from humans or animals exposed to the chemical warfare agents, since hydrophilic compounds will be concentrated in such liquids. The cholinesterase activity in blood should be measured to indicate possible exposure to nerve agents.

- *Cadavers*. Tissues or organs from dead humans or animals believed to have been exposed to the chemical warfare agents should be collected. The organs which provide most information are the kidneys, liver, heart and fatty tissue. These organs concentrate lipophilic compounds. Absorbed chemical agent my also be found in hair samples. In addition, samples from the skin or lungs should be collected to document any damage caused by vesicants. Nervous tissue could be collected to document exposure to nerve agents or other agents affecting the nervous system.

2.3.3 Numbers and sizes of samples

It is important to consider the number of samples which are required to allow correct conclusions to be drawn from the results of the sample analysis. We normally have little or no knowledge of the background concentrations in environmental and biological samples. Controls are therefore of the utmost importance if we are to obtain conclusive results from the analyses of such samples.

The following instructions should be followed in collecting environmental and biological samples:

- At least two liquid samples from bombs or shells should be collected in separate containers.

- In order to achieve at least 90 % probability of verifying a chemical attack, 20 environmental or battlefield samples should be randomly collected per area of 100 000 m^2 where the use of chemical weapons is alleged to have taken place. Fewer samples are necessary if clear evidence of such an attack has been obtained using devices such as CAM or detection paper. Three controls should be collected well outside the contaminated area and treated in the same way as the samples. The controls should be of a matrix as similar as possible to that of the samples.

- If it is possible to collect biological samples from humans or animals, at least two samples should be taken from each individual. If only one individual is available, more (10) samples should be taken. Body liquids from individuals not exposed to chemical weapons should also be collected as controls.

- The sample size should be about 50 g in the case of environmental samples (snow, water, sand, soil, concrete, etc) and about 20 cm^2 in the case of polymers, clothing or leather. About 10-50 g of body liquids or organs from dead humans or animals is considered sufficient. If the

samples need to be split before analysis, larger samples should be collected to get the above-mentioned sizes of each sub-sample.

2.3.4 Sample containers

The most satisfactory sample containers are glass bottles with leakproof caps, but mylar bags or metallized plastic bags may also be used. The containers should fulfil the following requirements:

- The containers should not release any chemicals which could contaminate the samples.

- It should not be possible for volatile compounds to escape from the containers.

- The containers should not consist of materials which strongly adsorb chemical warfare agents

- The containers should not accelerate the breakdown rate of chemical warfare agents.

- Gas samples should be passed through a column containing an adsorbent (e.g. Tenax) and should be placed in gas-tight containers.

2.3.5 Sampling procedure

To ensure the integrity of the samples, they should be collected by the inspection team itself. A spoon, spatula, scissors, knife, scalpel, scoop and pipette should be available for sample collection. In addition, personnel carrying out the sampling should wear full protective equipment. The sample containers and sampling equipment should be decontaminated after sampling by washing with 5 % sodium

hydroxide in a mixture of 2-propanol and water (1:1). Fullers' earth may also be used.

2.4 Field analysis

Field analysis can give the first indication of which chemical warfare agents are present in the area. This information may make it easier to select the best method for sample preparation and analysis, and thereby give the most reliable results.

The following techniques may be used for field analyses:

- Thin layer chromatography (TLC).

  Samples collected as described above are extracted with a small volume of dichloromethane, 20 μl of which are applied to silica TLC plates. Use the following mobile phases:
  cyclohexane:ethylacetate:acetone = 5:3:3 for sarin, soman and tabun,
  methanol:acetone = 4:1 for VX,
  n-hexane:methanol:dichloromethane = 7:1:2 for lewisite, clark and adamsite, and toluene for mustard gas.

  The nerve agents sarin, soman, tabun and VX are detected by an enzymatic reaction. Spray with cholinesterase (250 IU in 100 ml phosphate buffer pH=7.4), warm gently (30°C-40°C for 5 min) and spray with a mixture of 1-naphtylacetate (250 mg) and fast blue salt (400 mg) in ethanol (100 ml). White spots on a red background indicate the presence of nerve agents. Note that this reaction is very sensitive. If the concentrations of nerve agents in the samples are too high the spots become large and difficult to define.

Lewisite, clark and adamsite are detected by oxidation with potassium permanganate. Spray with potassium permanganate (40 mg in 100 ml water). White to yellow spots indicate the presence of these compounds.

Mustard gas is detected by spraying with 4(4'-nitrobenzyl)-pyridine (5g in 100 ml ethanol), heating to high temperature (150°C) and spraying with sodium hydroxide (4 g in 100 ml water:methanol=1:1). Blue spots which disappear quite rapidly indicate the presence of mustard gas.

The retention factors using the mobil phases described above are: tabun: 0.43, sarin: 0.34, soman: 0.48, VX: 0.62, lewisite I: 0.27, clark I: 0.52, clark II: 0.51, adamsite: 0.15 and mustard gas: 0.71.

- Information obtained by CAM should be used as an indication of the presence of nerve agents or mustard gas.

- Detection paper should be used on droplets or damp spots to give a indication of the presence of nerve agents or mustard gas.

- Other instruments should be considered as soon as miniaturization has made them available as mobile field equipment.

2.5 Sample handling

2.5.1 Sample sealing

The samples should be sealed and secured immediately after collection to prevent loss or tampering before analysis. The plastic bags and glass bottles used for sampling should be sealed with a lead seal to prevent tampering during transport and storage. It is also important that the containers used for sampling are airtight to prevent any loss of sample.

2.5.2 Sample coding and documentation

Each sample should receive a unique identification code, and all information should be recorded in a sample documentation form with corresponding coding. A three-page form has been drawn up for use by the sampling team and is shown as annex 1 to this report. The following information should be recorded in the form:

- On the first page, information on the sampling procedure is entered, including the reason for sampling, an indication of the priority or importance of the samples, description of samples and sampling site, sampling methods and results of field analyses.

- On the second page, a sketch of the sampling site should be drawn, indicating topography, any bomb craters observed and wind direction. The positions of the sampling sites should also be indicated on this sketch.

- The third page should be filled in if information on the attack is available. Reports from eyewitnesses, casualties, effects on vegetation and meteorological data such as temperature, wind and precipitation since the attack should be entered here. If there are casualties, reports from medical inspections should also be entered.

Two copies of the form should be made, one of which should accompany the samples to the Technical Secretariat, while the other should be kept by the sampling team.

2.5.3 Sample preservation

All samples should be treated as soon as possible after collection, to ensure that the chemical warfare agents are still present on arrival at the laboratory. The appropriate treatment varies according to the origin of the samples. To ensure the integrity of the samples, in some situations, no treatment is desirable. Sample preservation

should be performed outside the contaminated area in order to prevent cross-contamination of the samples and contamination of the equipment.

- As an easy means of field preservation, aqueous samples may be passed through a cartridge filled with a polymer C_{18} adsorbent (Analytichem International Inc.) which retains chemical warfare agents. The cartridge may then be transported to the laboratory for subsequent elution and analysis. Solid samples may be extracted with water and the extract passed through the C_{18} cartridge in the same way.

  Procedure:

  Wash the solid sample with 50 ml water and pass the sample through a 200 mg C_{18} cartridge which has been pre-wetted with 0.5 ml methanol and 5 ml water. In order to prevent clogging of the cartridge, samples containing large amounts of particulate matter should be filtered through a 20 μm pore-size frit filter or through a Whatman microfibre filter grade GF/A.

- Phosphonic acids, which are decomposition products from nerve agents, are preserved by sorption onto an aminopropyl weak anion exchanger (NH_2). Cartridges filled with 100 mg NH_2 material (Analytichem International Inc.) are attached after the C_{18} cartridges and the sample solution is passed through the combined cartridges. The chemical warfare agents are retained on the C_{18} cartridge (top) and the phosphonic acids on the NH_2 cartridge (bottom).

- Organs or tissues from humans or animals should be placed in ethanol for preservation during transport to the laboratory.

2.6 Sample transport

All samples should be properly secured to avoid injury to personnel handling the samples. This means that all samples should be transported surrounded by activated charcoal in a solid shock-resistant container. In addition, the samples should be treated in accordance with the following guidelines:

- To prevent degradation of chemical warfare agents during transport and storage, both the untreated samples and the C_{18} cartridges should be kept cold, preferably in a box filled with dry ice (-78.5°C). A freezing mixture, for example sodium chloride:ice = 1:3 (-21.3°C) or calcium chloride:ice (min. -55°C) could also be used.

- Liquid samples should not be frozen but should be transported cold in an insulated box with cooling elements.

- Each container should be properly packed and labelled according to the "Technical Instructions for the Safe Transport of Dangerous Goods by Air" (ICAO Doc 9284-AN/905). The shipping names: poisonous solid n.o.s (not otherwise specified) or poisonous liquid n.o.s in class 6.1 (UN no. 2811 and UN no. 2810, respectively) may be used for environmental samples containing only traces of chemical warfare agents. These compounds may be transported by passenger aircraft, except for those with an inhalation toxicity of Packing Group I (Great danger). It should be noted, however, that only boxes which are type approved for transport of dangerous goods may be used. A completed copy of the Shipper's Declaration for Dangerous Goods is shown in annex 2 to this report.

- A transport log should follow each parcel and be filled in by personnel in charge of each stage of the transport from the sampling site to the destination in order to maintain an unbroken chain of custody. The maximum permissible temperature during transport should be filled in by

the sampling team as information for personnel in charge of transport. A transport log has been drawn up and is shown as annex 3 to this report.

2.7 Sample handling in the laboratory

When the samples arrive at the laboratory, they should be treated in such a way that all information contained in the samples remains intact until the final analysis. This means that the following instructions should be followed:

- Upon arrival at the laboratory, the samples should be stored in a safe and tamper-proof place. Solid samples should be stored in a freezer at -20°C or lower and liquid samples preferably at +4°C in a refrigerator. Biological samples (including body liquids) should also be stored in a freezer, but serum or plasma should be separated from the blood samples before storage. The analyses should be carried out as soon as possible. If re-coding is necessary, all information given on the sample documentation form and in the transport log should be linked with the new coding.

- Before the main sample is split into sub-samples, it should be properly homogenized. Dry particulate samples such as sand or dry soil should be homogenized by shaking for three minutes in a shaking machine, while a mortar should be used for wet particulate samples. Other solid samples like concrete may, if necessary, be crushed into small pieces with a mortar. Since chemical warfare agents do not penetrate far into the material, the outer part of the sample is of most importance. Clothing, leather and polymers should be divided into sub-samples with a knife or scissors, and liquid samples well mixed before splitting.

- The extraction of the samples should be carried out in accordance with the recommended operating procedures for each sample material.

- The C_{18} cartridges brought back from the field should be eluted with 500μl of an organic solvent suitable for the final analysis. Acetone and dichloromethane have satisfactory eluting properties for chemical warfare agents and may be used for analysis by gas chromatography or mass spectrometry. For NMR or liquid chromatography, methanol may be used.

- The phosphonic acids are eluted from the NH_2 cartridges with 300 μl methanol. The eluates may be analyzed directly by HPLC or by GC after derivatization of the acids.

- The controls should be processed and analyzed in the same way as the samples in order to be sure that there has been no cross-contamination. The controls should also be spiked with any chemical warfare agent found to establish the recovery rate for the analytical method used.

- The recommended operating procedures for quality control for each instrument should be followed.

3 CHEMICAL PRODUCTION FACILITIES

3.1 Verification of location

Upon arrival at a chemical facility which is to be inspected, the position (coordinates) should be checked against the information given by the requesting state party to ensure that the correct area is examined. This should be done by comparing the terrain with a map, or by using navigational aids such as the global positioning system (GPS).

3.2 Where to take samples

The samples should be collected at the points specified in any facility agreement, or in the case of challenge inspection, at sites recommended by a process engineer in the inspection team. Samples most likely to contain information of interest are from feed stocks, process streams, reactors, storage tanks and waste. Samples from equipment not currently in use, but suspected to have been used for activities prohibited by the convention, may be collected by wiping with Whatman 41 filter paper.

3.3 Sampling

3.3.1 Recommended sample materials

The sample materials which are most likely to contain information of interest are:

- feed chemicals
- process liquids
- reaction mixtures
- products
- volatile and non-volatile waste (drainage ditches)
- wipe samples from equipment suspected to be contaminated with scheduled chemicals
- filter canisters used by personnel exposed to, or believed to be exposed to scheduled chemicals
- gasket materials

3.3.2 Numbers and sizes of samples

At least two samples should be collected from each sampling site in separate containers. The amount needed depends on the type of sample. For samples of the process steams and feed chemicals storage areas only a few grams are needed, but larger amounts (about 50 g) are needed for samples of waste. If the samples need to be split before analysis, larger samples should be collected to get the above-mentioned sizes of each sub-sample.

Controls should be collected to ensure that chemicals normally present in industrial samples do not interfere with the analysis of chemical warfare agents.

3.3.3 Sample containers

The most satisfactory sample containers are glass bottles with leakproof caps, but mylar bags or metallized plastic bags may also be used. The containers should fulfil the following requirements:

- The containers should not release any chemicals which cause contamination of the samples.

- It should not be possible for volatile compounds to escape from the containers.

- The containers should not consist of materials which strongly adsorb chemical warfare agents

- The containers should not accelerate the breakdown rate of chemical warfare agents.

- Gas samples should be passed through a column containing an adsorbent (e.g. Tenax) and should be placed in gas-tight containers.

3.3.4 Sampling procedure

To ensure the integrity of the samples, they should be collected by personnel from the chemical facility supervised by the inspection team. A spoon, spatula, scissors, knife, scoop and pipette should be available for sample collection. In addition, personnel carrying out the sampling should wear appropriate protective equipment. After sampling, the sample containers and sampling equipment should, if necessary, be decontaminated by washing with 5 % sodium hydroxide in a mixture of 2-propanol and water (1:1).

3.4 On-site analysis

The samples collected at the facility should, if possible, be analyzed on-site using in-house equipment or instrumentation brought by the inspection team. Simple equipment and methods such as CAM, detection paper and thin layer chromatography (see Chapter 2.4) may be used to screen for known chemical warfare agents. Electrical equipment has to be approved for use in the production facility.

3.5 Sample handling

3.5.1 Sample sealing

The samples should be sealed and secured immediately after collection to prevent loss or tampering before analysis. The plastic bags and glass bottles used for sampling should be sealed with a lead seal to prevent tampering during transport and storage. It is also important that the containers used for sampling are air tight to prevent any loss of sample.

3.5.2 Sample coding and documentation

Each sample should receive a unique identification code, and all information should be recorded in a sample documentation form with corresponding coding. The first two pages of the three-page form described in Chapter 2.5.2 may be used and completed with the following information:

- On the first page, information on the sampling procedure is entered, including the reason for sampling, an indication of the priority or importance of the samples, description of samples and sampling site, sampling methods and results of on-site analyses.

- On the second page, a sketch of the relevant part of the chemical production facility should be drawn, indicating pipelines, reactors and the positions of the sampling sites.

Three copies of the form should be made, one of which should accompany the samples to the Technical Secretariat, one should be left with the state party inspected and one should be kept by the sampling team.

3.5.3 Sample preservation

All samples should be treated as soon as possible after collection, to ensure that the chemical warfare agents are still present on arrival at the laboratory. The appropriate treatment varies according to the origin of the samples. To ensure the integrity of the samples, in some situation, no treatment is desirable.

- Aqueous samples (e.g. waste water) should be preserved by passing the sample through a cartridge filled with a polymer C_{18} adsorbent which retains most of the scheduled chemicals. The cartridge may then be transported to the laboratory for subsequent elution and analysis.

Procedure:

Pass 50 ml of the aqueous sample through a 200 mg C_{18} cartridge which has been pre-wetted with 0.5 ml methanol and 5 ml water. In order to prevent clogging of the cartridge, samples containing large amounts of particulate matter should be filtered through a 20 μm pore-size frit filter or through a Whatman microfibre filter grade GF/A.

- Phosphonic acids, which are decomposition products from nerve agents, are preserved by sorption to an aminopropyl weak anion exchanger (NH_2). Cartridges filled with 100 mg NH_2 material (Analytichem International Inc.) are attached after the C_{18} cartridges and the sample solution is passed through the combined cartridges. The chemical warfare agents are retained on the C_{18} cartridge (top) and the phosphonic acids on the NH_2 cartridge (bottom).

3.6 Sample transport

All samples should be properly secured to avoid injury to personnel handling the samples. This means that all samples should be transported surrounded by activated charcoal in a solid shock-resistant container. In addition, the samples should be treated in accordance with the following guidelines:

- To prevent degradation of chemical warfare agents during transport and storage, both the untreated samples and the C_{18} cartridges should be kept cold, preferably in a box filled with dry ice (-78.5°C). A freezing mixture, for example sodium chloride:ice = 1:3 (-21.3°C) or calcium chloride:ice (min. -55°C) could also be used.

- Liquid samples should not be frozen but should be transported cold in an insulated box with cooling elements.

- Each container should be properly packed and labelled according to the "Technical Instructions for the Safe Transport of Dangerous Goods by Air" (ICAO Doc 9284-AN/905). The shipping names: poisonous solid n.o.s or poisonous liquid n.o.s in class 6.1 (UN no. 2811 and UN no. 2810 respectively), may be used for samples containing only traces of chemical warfare agents. These compounds can be transported by passenger aircraft, except for those with an inhalation toxicity of Packing Group I (Great danger). It should be noted, however, that only boxes which are type approved for transport of dangerous goods may be used. A completed copy of the Shipper's Declaration for Dangerous Goods is shown in annex 2 to this report.

- A transport log should follow each parcel and be filled in by the personnel in charge of each part of the transport from the sampling site to the destination in order to maintain an unbroken chain of custody. The maximum permissible temperature during transport should be filled in by the sampling team as information for the personnel in charge of transport. A transport log has been drawn up and is shown as annex 3 to this report.

3.7 Sample handling in the laboratory

When the samples arrive at the laboratory, they should be treated in such a way that all information contained in the samples remains intact until the final analysis. This means that the following instructions should be followed:

- Upon arrival at the laboratory, the samples should be stored in a safe and tamper-proof place. Solid samples should be stored at -20°C or -70°C in a freezer and liquid samples preferably at +4°C in a refrigerator. The analysis should be carried out as soon as possible. If re-coding is necessary, all information given on the sample documentation form and in the transport log should be linked with the new coding.

- Before the main sample is split into sub-samples, it should be properly homogenized. Dry particulate samples should be homogenized by shaking for three minutes in a shaking machine, while a mortar should be used for wet particulate samples. Other solid samples may be crushed into small pieces with a mortar, and liquid samples well mixed before splitting.

- The extraction of the samples should be carried out in accordance with the recommended operating procedures for each sample material.

- The C_{18} cartridges brought back from the facility should be eluted with 500 μl of an organic solvent which is suitable for the final analysis. Acetone and dichloromethane have satisfactory eluting properties for chemical warfare agents and may be used for analysis by gas chromatography or mass spectrometry. For NMR or liquid chromatography methanol may be used.

- The phosphonic acids are eluted from the NH_2 cartridges with 300 μl methanol. The eluates may be analyzed directly by HPLC or by GC after derivatization of the acids.

- The controls should be processed and analyzed in the same way as the samples in order to be sure that there has been no cross-contamination. The controls should also be spiked with any chemical warfare agent found to establish the recovery rate for the analytical method used.

- The recommended operating procedures for quality control for each instrument should be followed.

4 LIST OF EQUIPMENT

The equipment needed for sampling, field analysis and sample handling in the field before transport should be packed in suitable (aluminum) boxes for easy transport to the sampling area, each box containing the equipment needed to carry out one part of the sampling and sample preparation procedure. If any part of the procedure is to be omitted, the corresponding equipment may be left behind without repacking.

The suggested composition of the boxes is listed below.

Box A: Equipment for sample collection

24 glass bottles (250ml) with screw caps
25 mylar bags
25 labels
1 box Whatman 41 filter paper
1 measuring cylinder (100 ml)
2 spoons
1 spatula
1 pair of scissors
1 scalpel
2 funnels
1 spray candle paint to mark the contaminated area
1 thermometer
1 measuring tape
equipment for sealing the samples
stationery
adhesive tape
10 sample documentation forms
5 transport logs

Box B: Equipment for solid-phase extraction

30 C_{18} cartridges (200 mg sorbent)
30 NH_2 cartridges (100 mg sorbent)
4 adapters
2 vacuum equipment (model NDRE)
1 microlitre pipette with tips (5 ml)
1 vacuum pump (12 VDC) with cable
1 thermos
8 glass bottles (50 ml) with screw caps
1 pair of tweezers
1 box Whatman filter GF-A
250 ml methanol
1 measuring cylinder (100 ml)
stationery

Box C: Equipment for TLC

250 ml chloroform
2 separating chambers with teflon covers
10 blotting papers
15 TLC plates
microcapillary applicators
1 spray equipment
1 microlitre pipette with tips (5 ml)
1 pair of tweezers
stationery
mobile phases
developing reagents

Box D: Protective equipment

Individual items: respirator
protective suit
2 pairs of boots
5 pairs of gloves
atropine/oxime autoinjectors
fullers' earth

1 box latex gloves (100 pieces)

Box E: Additional equipment

1 spraygun
1 spare bottle for spraygun
decontamination liquid (2-propanol/water/NaOH)
chloramine T
1 water can
1 funnel
1 measuring cylinder
1 primus
4 l kerosene
100 ml methylated spirit
1 adhesive tape (2-sided)
1 adhesive tape (1-sided)
1 box kleenex tissue paper
atropine/oxime autoinjectors
pyrido prophylactic
fullers' earth
10 plastic bags (for litter)
stationery

In addition the following equipment should be available:

map of the area under verification
GPS receiver (global positioning system)
chemical agent monitor (CAM)
detection paper
water analysis kit

5 REFERENCES

(1) Norwegian Working Paper on Verification of a Chemical Weapons Convention - Sampling and analysis of chemical warfare agents under winter conditions. Document CD/311 of 11 August 1982.

Research Report on Verification of a Chemical Weapons Convention. Sampling and analysis of chemical warfare agents under winter conditions. Annex to Document CD/311 of 11 August 1982.

(2) Norwegian Working Paper on Verification of a Chemical Weapons Convention - Sampling and analysis of chemical warfare agents under winter conditions. Document CD/396 of 19 July 1983.

Research Report on Verification of a Chemical Weapons Convention. Sampling and analysis of chemical warfare agents under winter conditions. Part II. Annex to Document CD/396 of 19 July 1983.

(3) Norwegian Working Paper on Verification of a Chemical Weapons Convention - Sampling and analysis of chemical warfare agents under winter conditions. Document CD/508 of 15 June 1984.

Research Report on Verification of a Chemical Weapons Convention. Sampling and analysis of chemical warfare agents under winter conditions. Part III. Presented as Document CD/509 of 15 June 1984.

(4) Norwegian Working Paper on Verification of a Chemical Weapons Convention - Sampling and analysis of chemical warfare agents under winter conditions. Document CD/600 of 20 June 1985.

Norwegian Working Paper on Alleged Use of Chemical Warfare Agents under Winter Conditions. Document CD/601 of 20 June 1985.

Research Report on Verification of a Chemical Weapons Convention. Sampling and analysis of chemical warfare agents under winter conditions. Part IV. Presented as Document CD/598 of 20 June 1985.

(5) Norwegian Working Paper on Verification of a Chemical Weapons Convention - Procedures for verification of alleged use of chemical weapons. Document CD/703 of 16 June 1986.

Norwegian Working Paper on Verification of a Chemical Weapons Convention - Evaluation of methods for identification of arsenic containing chemical warfare agents. Document CD/704 of 16 June 1986.

Research Report on Verification of a Chemical Weapons Convention. Sample handling of chemical warfare agents. Part V. Presented as Document CD/702 of 16 June 1986.

(6) Norwegian Working Paper on Verification of Alleged Use of Chemical Weapons - Summary of research results 1986/87. Document CD/761 of 24 June 1987.

Norwegian Working Paper on General Procedures for Verification of Alleged Use of Chemical Weapons for Consideration in the Negotiations on the Chemical Weapons Convention. Document CD/762 of 24 June 1987.

Research Report on Verification of a Chemical Weapons Convention. Development of procedures for verification of alleged use of chemical warfare agents. Part VI. Presented as Document CD/776 of 28 July 1987.

(7) Norwegian Working Paper on Verification of Alleged Use of Chemical Warfare Agents. Document CD/861 of 22 August 1988.

Research Report on Verification of a Chemical Weapons Convention. Development of procedures for verification of alleged use of chemical warfare agents. Part VII. Presented as Document CD/857 of 12 August 1988.

(8) Norwegian Working Paper on Verification of Alleged Use of Chemical Weapons: A new approach for verification procedures. Document CD/936 of 21 July 1989.

Research Report on Verification of a Chemical Weapons Convention. Headspace Gas Chromatography - A new technique in verification of alleged use of chemical warfare agents. Part VIII. Presented as Document CD/940 of 31 July 1989.

(9) Report on a national trial inspection of an industrial chemical facility. Document CD/CW/WP.285 of 10 April 1990.

Norwegian Working Paper on Verification of Alleged Use of Chemical Weapons: Use of sorbent extraction in verification of alleged use of chemical weapons. Document CD/1008 of 26 June 1990.

Research Report on Verification of a Chemical Weapons Convention. Use of sorbent extraction in verification of alleged use of chemical weapons. Part IX. Presented as Document CD/1019 of 23 July 1990.

(10) Norwegian Working Paper on Verification of Alleged Use of Chemical Warfare Agents: Application of procedures after a simulated chemical attack on an air base. Document CD/CW/WP.340 of 30 May 1991.

Research Report on Verification of a Chemical Weapons Convention. Application of procedures after a simulated chemical attack on an air base. Part X. Presented as Document CD/1084 of 14 June 1991.

ANNEX 1 SAMPLE DOCUMENTATION FORM

SAMPLE DOCUMENTATION. SAMPLING.	Page 1 of 3

Items 1-11 refer to the sampling procedure.

1. Name : John Tørnes Date : 31.10.90 Time : 09:20

   Position : Scientist

2. Reason for sampling :
   Suspected attack on airbase with chemical weapons

3. Sample priority : First ☒ Second ☐ Third ☐

4. Sample code number :	d 3110-4
a 3110-1	e
b 3110-2	f
c 3110-3	g
5. Description of sample :	d Water
a Soil	e
b Sand	f
c Protective clothing from leg	g
6. Method of obtaining the sample(s) :	d Surface water
a Spooned from the surface	e
b Spooned from the surface	f
c Scissors	g

7. Results of field analysis (CAM, TLC) :

   CAM positive response in G mode
   TLC positive response for GA, GB, L, VX and H

8. Weather conditions :
   Partly cloudy, good weather, no precipitation
   Wind 14 kts from SSE, temperature 8°C

9. Description of sample site (topography, vegetation etc) :

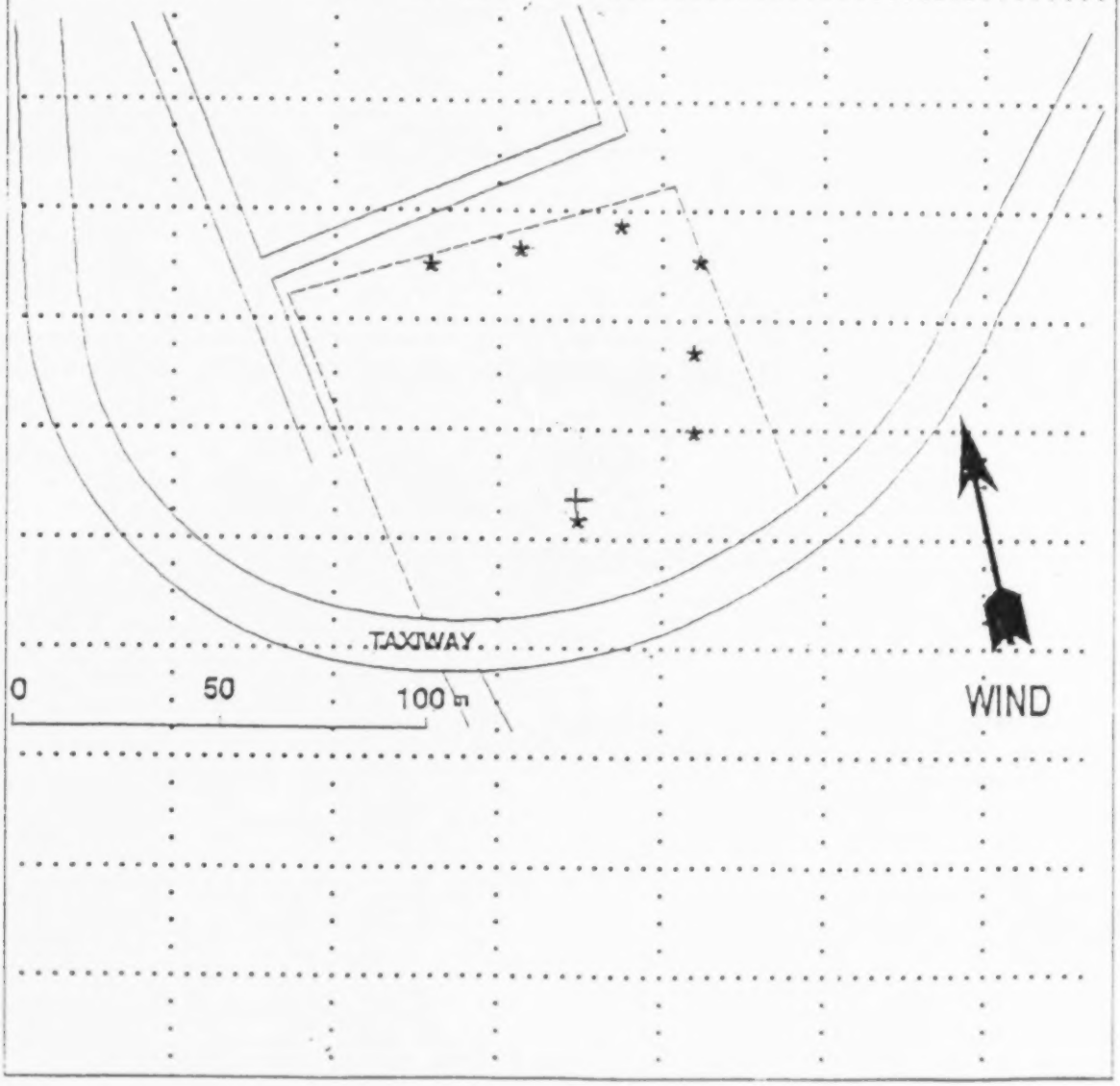
   Relatively flat field with black soil covered with long grass and low birches

10. Location of sample site (map reference UTM) :

    Northing: Easting:

SAMPLE DOCUMENTATION. SAMPLING. Page 2 of 3

11. Sketch of site , topography, bomb craters etc.
Use cross and sample code number to give sample site.
Please indicate North-South and wind direction.



SAMPLE DOCUMENTATION. ATTACK.	Page 3 of 3
Items 12-17 refer to observations concerning the attack.	
12. Date :	Time :
13. Weather conditions since the attack :	
14. Symptoms of casualties (humans/animals) :	
15. Effect on vegetation :	
16. Description of the attack method of delivery, smell, sound etc)	
17. Description of munitions found at the site :	
18. Remarks :	

ANNEX 2 SHIPPER'S DECLARATION

Shippers Declaration for Dangerous Goods

Shipper

NORWEGIAN DEFENCE RESEARCH
Establishment
P.O. Box 25,

N-2007 KJELLER, NORWAY

Air Waybill No.

Page of Pages

Shipper's Reference Number

Consignee

ANDØYA AIRPORT
Andenes

Norway

Two completed and signed copies of this Declaration must be handed to the operator

WARNING

Failure to comply in all respects with the applicable Dangerous Goods Regulations may be in breach of the applicable law, subject to legal penalities. This Declaration must not, in any circumstances, be completed and/or signed by a consolidator, a forwarder or an IATA cargo agent.

TRANSPORT DETAILS

This shipment is within the limitations prescribed for (delete non-applicable)

PASSENGER AND CARGO AIRCRAFT ~~CARGO AIRCRAFT ONLY~~

Airport of Departure: Oslo, Fornebu

Airport of Destination: ANDENES

Shipment type (delete non-applicable)

NON-RADIOACTIVE ~~RADIOACTIVE~~

NATURE AND QUANTITY OF DANGEROUS GOODS (see sub-Section 8.1 of IATA Dangerous Goods Regulations)

Dangerous Goods Identification						
Proper Shipping Name	Class or Division	UN or ID No.	Subsidiary risk	Quantity and type of packing	Packing inst.	Authorization
Poisonous solids n.o.s. (Environmental samples containing chemical warfare agents)	6.1	UN2811		1 Plywood box x 2 kg	606	
Poisonous liquids n.o.s. (Water containg chemical warfare agents)	6.1	UN2810		1 Plywood box x 1 l	601	

Additional Handling Information

I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked and labelled, and are in all respects in the proper condition for transport by air according to the applicable International and National Government Regulations.

Name/Title of Signatory

Place and Date

Signature (see warning above)

ANNEX 3 TRANSPORT LOG

TRANSPORT LOG.

1. Sampling carried out by : B.A.Johnsen

   Confirmed by : P.J.Karlsen

   Date : 31/10-90 Time : 09:20 Parcel number : 1

   Total number of parcels in shipment : 1

   Temp should not exceed : 10 °C Description of parcel : Wooden case

2. Transport and storage information.

Date and time received	Place received	Means of transport	Temperature during transport	Name and position
31/10-90 12:30	Airbase terminal	Car	8	Terminal leader
31/10-90 19:00	Oslo airport	Military plane	25	Private M.Plassen
31/10-90 19:30	NDRE Kjeller	Car	10	Scient. J.Tørnes

3. Received by J.Aa.Tørnes (sign)

   Institution NDRE Date : 31/10-90 Time : 19:30

CONFERENCE ON DISARMAMENT

CD/1154
12 June 1992

Original: ENGLISH

LETTER ADDRESSED TO THE SECRETARY-GENERAL OF THE CONFERENCE ON DISARMAMENT BY THE PERMANENT REPRESENTATIVE OF TURKEY ON 9 JUNE 1992

The Government of the Republic of Turkey took note of the declaration made on 27 April 1992 on behalf of the Republic of Serbia and the Republic of Montenegro, announcing the inception of the "Federal Republic of Yugoslavia", and asserting that the "Federal Republic of Yugoslavia" is the legal and political successor of the former Socialist Federal Republic of Yugoslavia.

The said declaration raises the question of representation of the former Socialist Federal Republic of Yugoslavia by the "Federal Republic of Yugoslavia" at international organizations, including the Conference on Disarmament.

I have the honour to inform you that, under the present circumstances, Turkey cannot recognize the "Federal Republic of Yugoslavia". In this context, the participation of the representatives of that country to the meetings of the United Nations and other related international bodies including the Conference on Disarmament does not prejudice Turkey's position regarding the matter.

The contents of this message has been transmitted to the Secretary-General of the United Nations with a request that it be circulated as a document of the General Assembly. I would be grateful if this letter could be circulated as an official document of the Conference on Disarmament.

(Signed): Gündüz AKTAN
Ambassador
Permanent Representative

GE.92-61801/9852a

CONFERENCE ON DISARMAMENT

CD/1155
22 June 1992

Original: ENGLISH

LETTER DATED 19 JUNE 1992 FROM THE PERMANENT REPRESENTATIVE OF FINLAND ADDRESSED TO THE SECRETARY-GENERAL OF THE CONFERENCE ON DISARMAMENT TRANSMITTING THE LATEST VOLUME OF THE BLUE BOOK SERIES ON VERIFICATION OF CHEMICAL DISARMAMENT ENTITLED "INTERNATIONAL INTERLABORATORY COMPARISON (ROUND-ROBIN) TEST FOR THE VERIFICATION OF CHEMICAL DISARMAMENT; F.3. TESTING OF PROCEDURES ON SIMULATED MILITARY FACILITY SAMPLES" 1/

I have the honour to enclose herewith the latest volume of the Blue Book series on verification of chemical disarmament entitled "International Interlaboratory Comparison (Round-Robin) Test for the Verification of Chemical Disarmament; F.3. Testing of Procedures on Simulated Military Facility Samples".

This seventeenth volume of the series is the third report describing the results of international experiments on verification analysis. Laboratories from 15 different countries participated in the experiment which was coordinated by Finland. The presentation of this report would not have been possible without close cooperation by all participants throughout the experiment and it should indeed be considered as a joint contribution of all participating laboratories.

I would kindly request you to circulate the report as an official document of the Conference on Disarmament.

(Signed) Antti Hynninen
Ambassador
Permanent Representative
of Finland

1/ A limited distribution of this volume in English only has been made available to the members and non-members invited to participate in the work of the Conference on Disarmament. Additional copies are available from the Permanent Mission of Finland at Geneva.

GE.92-61940/4362H

CONFERENCE ON DISARMAMENT

CD/1156
23 June 1992

Original: ENGLISH

LETTER ADDRESSED TO THE SECRETARY-GENERAL OF THE CONFERENCE ON DISARMAMENT BY THE LEADER OF THE UNITED KINGDOM DELEGATION ON 23 JUNE 1992

I should like to draw your attention to the following announcement made by Mr. Malcolm Rifkind MP, United Kingdom, Secretary of State for Defence, in answer to a Parliamentary Question in the House of Commons on 15 June 1992:

> "The North Atlantic Treaty Organization confirmed last autumn that the sub-strategic nuclear capability remains essential to provide the link between conventional and strategic forces, but that significant reductions in sub-strategic nuclear forces were now possible. In addition to the reductions announced last autumn, the alliance has decided to terminate the deployment of United States nuclear depth bombs on NATO maritime patrol aircraft.
>
> "The Government are committed to maintaining the United Kingdom's nuclear arsenal at the minimum level necessary for our deterrent needs. My predecessor announced last September that tactical nuclear weapons would no longer be deployed on Royal Navy ships in normal circumstances. The Government have now decided that this residual capability is no longer needed. Royal Navy ships and aircraft and Royal Air Force maritime patrol aircraft will therefore no longer have the capability to deploy tactical nuclear weapons. The United Kingdom weapons previously earmarked for this role will be destroyed. The United Kingdom's sub-strategic nuclear capability will therefore consist of Royal Air Force dual-capable aircraft with the WE177 free-fall bomb."

I believe the above statement has a direct relevance to the work of the Conference on Disarmament and I should be grateful if you would circulate this letter as an official document of the Conference.

(Signed) Michael Weston
Ambassador

CONFERENCE ON DISARMAMENT

CD/1157
25 June 1992

Original: ENGLISH

LETTER DATED 24 JUNE 1992 FROM THE PERMANENT REPRESENTATIVE OF AUSTRALIA TO THE UNITED NATIONS FOR DISARMAMENT MATTERS ADDRESSED TO THE SECRETARY-GENERAL OF THE CONFERENCE ON DISARMAMENT TRANSMITTING THE STATEMENT ISSUED BY PARTICIPATING STATES AT THE CONCLUSION OF THE THIRD CHEMICAL WEAPONS REGIONAL SEMINAR, HELD IN SYDNEY, AUSTRALIA, FROM 21 TO 23 JUNE 1992

I have the honour to transmit herewith the Statement issued by participating States at the conclusion of the third Chemical Weapons Regional Seminar, held in Sydney, Australia, from 21-23 June 1992.

I should be grateful if you would take the necessary steps to circulate this Statement as an official document of the Conference on Disarmament.

(Signed): Paul O'Sullivan

GE.92-61988/9926a

CHEMICAL WEAPONS REGIONAL INITIATIVE (CWRI)
THIRD SEMINAR SYDNEY - 21-23 JUNE, 1992
SEMINAR STATEMENT

Seminar participants from Australia, Brunei Darussalam, the Cook Islands, Fiji, Indonesia, Kiribati, Laos, Malaysia, the Federated States of Micronesia, Myanmar, New Zealand, Papua New Guinea, the Philippines, Singapore, the Solomon Islands, Thailand, Tonga, Tuvalu, Vanuatu, Vietnam and Western Samoa met informally in Sydney on 21-23 June, 1992 in order to consider progress towards eliminating chemical weapons and preventing their future development under a global Chemical Weapons Convention (CWC), and to share views and exchange information on recent developments.

Seminar participants noted that their countries are not producers of chemical weapons, and have no intention of developing, stockpiling, deploying or using such weapons, nor of allowing their introduction into the region. Seminar participants affirmed their respective government's shared abhorrence of chemical weapons, their use or threat of use. They call upon all states which possess chemical weapons and/or chemical weapons production facilities on their territories or in any place under their jurisdiction or control to respect the regional consensus against chemical weapons, and to take early steps to become party to the Convention, with the objective of totally banning and destroying this class of weapon and its production facilities.

In particular, participants agreed that the conclusion of a comprehensive, verifiable, universal and non-discriminatory CWC remains absolutely central to ensuring a world freed from the use and threat of use of chemical weapons.

Participants urged those involved in the Conference on Disarmament (CD) to redouble their negotiating efforts as a matter of the highest priority, in response to the 1991 call of the United Nations General Assembly that a Convention be agreed during the CD's 1992 session. Participants noted with satisfaction the role in support of this objective being played by regional states which are CD members or observers and the favourable response given to the Australian proposal of 19 March, 1992 with a view to speeding up negotiations on the basis of a compromise package approach, taking into account the security and economic interests of all countries.

Participants affirmed their respective governments' views that the global and regional effectiveness of the forthcoming Convention would be considerably enhanced by early action by all states of South East Asia and the South Pacific to adhere

as original states parties. Participants confirmed that their respective governments were giving favourable consideration to the United Nations General Assembly's call to all states to commit themselves to becoming original states parties to the CWC.

In this context, participants noted the requirement in the Chemical Weapons Convention draft text for each state party to make initial declarations on chemical weapons - relevant matters. In preparation for signature of the Convention, and noting the potential regional confidence-building benefits of such declarations in their own right, participants recommended that governments in the region mutually exchange statements in the terms required for such declarations. Participants agreed that this regional initiative in support of the Convention be drawn to the attention of the Conference on Disarmament.

Although unable to participate in the Seminar, Nauru has expressed a wish formally to associate itself with the above Statement.